What is claimed is:

1. A method for evaluating the morphogenic activity of a candidate morphogenic protein or analog thereof, the method comprising the steps of:

(a) creating a local permissive defect site in a mammal,

(b) administering a said candidate morphogenic protein or analog systemically to said mammal, and

(c) measuring the ability of candidate protein or analog to induce new tissue formation at said defect site.

2. The method of claim 1 wherein said candidate morphogenic protein or analog is administered at a site distal to said defect site.

3. A method for evaluating an optimal dosage of a candidate morphogenic protein or analog thereof for administering to a mammal, the method comprising the steps of:

(a) creating a local permissive defect site in a mammal, and

(b) administering a said candidate morphogenic protein or analog systemically to said mammal, and

(c) measuring the ability of candidate protein or analog to induce new tissue formation at said defect site.

4. The method of claim 3 wherein said protein or analog is administered at a site distal to said locus.

5. The method of claim 1 or 3 wherein said defect locus occurs in skeletal, lung, cardiac, liver, neural, pancreas, uterine, or thyroid tissue.

6. The method of claim 1 or 3 wherein said defect locus occur in renal tissue.

7. The method of claim 1 or 3 wherein said defect locus occurs in dental or periodontal tissue.

8. The method of claim 1 or 3 wherein said mammal is aged.

9. The method of claim 1 or 3 wherein said mammal has a reduced capacity to induce callus formation.

10. The method of claim 1 or 3 wherein said mammal is afflicted with impaired blood flow to the skeletal extremities.

11. The method of claim 1 or 3 wherein said mammal has a reduced capacity to induce an endogenous morphogenetic signal.

12. The method of claim 1 or 3 wherein morphogenic protein or analog is administered parenterally.

13. The method of claim 12 wherein morphogenic protein or analog is administered intravenously.

14. The method of claim 1 or 3 wherein said morphogenic protein is administered orally.

15. The method of claim 1 wherein said morphogenic protein or analog is administered to said mammal at a time when mesenchymal progenitor cells are accessible to said defect locus.

16. The method of claim 1, 3 or 4 wherein said morphogenic protein or analog is administered at least six hours after the creation of said defect.

17. The method of claim 1 or 4 wherein said morphogenic protein or analog is administered at least 24 hours after the creation of said defect.

18. The method of claim 1 or 4 wherein said morphogenic protein or analog is administered at least 72 hours after the creation of said defect.

19. The method of claim 1, 3 or 4 wherein said morphogenic protein or analog is administered to said mammal after the initiation of fibrosis at said defect locus.

20. The method of claim 1, 3 or 4 wherein said morphogenic protein or analog is administered in aqueous solution.

21. The method of claim 8 wherein said mammal is a steroidal drug user.

22. The method of claim 8 wherein said mammal is aged, obese, hypertensive, or afflicted with osteopenia or diabetes.

23. The method of claim 1 or 3 wherein said morphogenic protein is selected from the group consisting of: OP1; OP2, OP3, BMP2; BMP3; BMP4; BMP5; BMP6; BMP9; BMP-10, BMP-11, BMP-12, BMP-15, BMP-3b, DPP; Vg1; Vgr; 60A protein; GDF-1; GDF-3, GDF-5, GDF-6, GDF-7, GDF-8, GDF-9, GDF-10, GDF-11; and morphogenically active amino acid sequence variants thereof.

24. The method of claim 1 or 3 wherein said morphogenic protein is selected from the group consisting of: OP1; OP2, BMP2; BMP4; BMP5; BMP6; and morphogenically active amino acid sequence variants thereof.

25. The method of claim 1 or 3 wherein said morphogenic protein is a morphogen, said morphogen comprising an amino acid sequence having at least 70% homology within the C-terminal 102-106 amino acids, including the conserved seven cysteine domain, of human OP1.

26. The method of claim 1 or 3 wherein said morphogenic protein is OP1.

27. The method of claim 1 or 3 wherein said morphogenic protein is mature OP1 solubilized in a saline solution.

28. The method of claim 1 or 3 wherein said morphogenic protein comprises an amino acid sequence defined by OPX (Seq. ID No. 3); Generic Sequence 6 (Seq. ID No. 4, Generic Sequence 7 (Seq. ID No. 5); Generic Sequence 8 (Seq. ID No. 6); or Generic Sequence 9 (Seq. ID No. 7).

29. A method for inducing new tissue formation at a nonskeletal defect locus in a mammal, the method comprising the step of administering morphogenic protein systemically to said mammal.

30. The method of claim 29 wherein said morphogenic protein is administered at a site distal to said locus.

31. A method for enhancing the quantity or quality of callus formation at an morphogenic defect locus in a mammal, the method comprising the step of administering morphogenic protein systemically to said mammal at a site distal to said locus.

32. A method for enhancing the rate of tissue repair at a local defect site in a mammal, the method comprising the step of administering an morphogenic protein systemically to said mammal at a site distal to said locus.

33. The method of claim 29, 31, or 32 wherein said defect locus occur in lung, cardiac, liver, neural, pancreas, uterine, or thyroid tissue.

34. The method of claim 29, 31, or 32 wherein said defect locus occur in renal tissue.

35. The method of claim 29, 31, or 32 wherein said defect locus dontal or periodontal tissue.

36. The method of claim 29, 31, or 32 wherein said mammal is a human.

37. The method of claim 36 wherein said human has a reduced capacity to induce callus formation.

38. The method of claim 36 wherein said human is afflicted with impaired blood flow to the skeletal extremities.

39. The method of claim 36 wherein said individual has a reduced capacity to induce an endogenous morphogenetic signal.

40. The method of claim 29, 31 or 32 wherein morphogenic protein is administered parenterally.

41. The method of claim 40 wherein morphogenic protein is administered intravenously.

42. The method of claim 29, 31, or 32 wherein said morphogenic protein is administered orally.

43. The method of claim 29 wherein said morphogenic protein is administered to said individual at a time when mesenchymal progenitor cells are accessible to said defect locus.

44. The method of claim 29, 31, or 32 wherein said morphogenic protein is administered at least six hours after the creation of said defect.

45. The method of claim 29 or 32 wherein said morphogenic protein is administered at least 24 hours after the creation of said defect.

46. The method of claim 29 or 32 wherein said morphogenic protein is administered at least 72 hours after the creation of said defect.

47. The method of claim 29, 31, or 32 wherein said morphogenic protein is administered to said mammal after the initiation of fibrosis at said defect locus.

48. The method of claim 29, 31, or 32 wherein said morphogenic protein is administered in aqueous solution.

49. The method of claim 36 wherein said human is a steroidal drug user.

50. The method of claim 36 wherein said human is aged, obese, or afflicted with osteopenia or diabetes.

51. The method of claim 29, 31, or 32 wherein said morphogenic protein is selected from the group consisting of: OP1; OP2, OP3, BMP2; BMP3; BMP4; BMP5; BMP6; BMP9; BMP-10, BMP-11, BMP-12, BMP-15, BMP-3b, DPP; Vg1; Vgr; 60A protein; GDF-1; GDF-3, GDF-5, GDF-6, GDF-7, GDF-8, GDF-9, GDF-10, GDF-11; and morphogenically active amino acid sequence variants thereof.

52. The method of claim 29, 31, or 32 wherein said morphogenic protein is selected from the group consisting of: OP1; OP2, BMP2; BMP4; BMP5; BMP6; and morphogenically active amino acid sequence variants thereof.

53. The method of claim 29, 31, or 32 wherein said morphogenic protein is a morphogen, said morphogen comprising an amino acid sequence having at least 70% homology within the C-terminal 102-106 amino acids, including the conserved seven cysteine domain, of human OP1.

54. The method of claim 29, 31, or 32 wherein said morphogenic protein is OP1.

55. The method of claim 29, 31, or 32 wherein said morphogenic protein is mature OP1 solubilized in a saline solution.

56. The method of claim 29, 31, or 32 wherein said morphogenic protein comprises an amino acid sequence defined by OPX (Seq. ID No. 3); Generic Sequence 6 (Seq. ID No. 4, Generic Sequence 7 (Seq. ID No. 5); Generic Sequence 8 (Seq. ID No. 6); or Generic Sequence 9 (Seq. ID No. 7).

57. A composition for systemic administration of an morphogenic protein to a mammal, said composition comprising morphogenic protein in an amount sufficient to induce nonskeletal functional replacement tissue formation at a defect locus.

58. The composition of claim 57 wherein said composition comprises morphogenic protein dispersed in an aqueous solution.

59. The composition of claim 57 having a pH in the range of about 4-8.

60. The composition of claim 57 comprising physiologically buffered saline.

61. The composition of claim 57 wherein said morphogenic protein is provided at a concentration within the range of about 0.01 - 1000 mg/kg body weight.

62. The composition of claim 57 comprising a formulation for parentral administration.

63. The composition of claim 57 formulated for oral administration.

64. The composition of claim 57 wherein said morphogenic protein is disposed in a biodegradable, biocompatible microsphere.

65. The composition of claim 57 comprising morphogenic protein in a concentration range of about 0.01 g/ml - 10.0 g/ml.

66. The composition of claim 57 comprising morphogenic protein in a con concentration range of about 0.1 g/ml - 1.0 g/ml.

67. The composition of claim 57 wherein said morphogenic protein is associated with a molecule competent to enhance solubility of said protein in aqueous media.

68. The composition of claim 57 wherein said morphogenic protein comprises of the soluble complex form of said protein.

69. The composition of claim 57 further characterized as competent to enhance the rate of tissue formation at a local defect site.

70. The composition of claim 57 wherein said morphogenic protein is selected from the group consisting of: OP1; OP2, OP3, BMP2; BMP3; BMP4; BMP5; BMP6; BMP9; BMP-10, BMP-11, BMP-12, BMP-15, BMP-3b, DPP; Vg1; Vgr; 60A protein; GDF-1; GDF-3, GDF-5, GDF-6, GDF-7, GDF-8, GDF-9, GDF-10, GDF-11; and morphogenically active amino acid sequence variants thereof.

71. The composition of claim 57 wherein said morphogenic protein is selected from the group consisting of: OP1; OP2, BMP2; BMP4; BMP5; BMP6; and morphogenically active amino acid sequence variants thereof.

72. The composition of claim 57 wherein said morphogenic protein is a morphogen, said morphogen comprising an amino acid sequence having at least 70% homology within the C-terminal 102-106 amino acids, including the conserved seven cysteine domain, of human OP1.

73. The composition of claim 57 wherein said morphogenic protein is OP1.

74. The composition of claim 57 wherein said morphogenic protein is mature OP1 solubilized in a saline solution.

75. The composition of claim 57 wherein said morphogenic protein comprises an amino acid sequence defined by OPX (Seq. ID No. 3); Generic Seq. 6 (Seq. ID No. 4); Generic Seq. 7 (Seq. ID No. 5); Generic Seq. 8 (Seq. ID No. 6); or Generic Seq. 9 (Seq. ID No. 7).

76. A method for inducing bone or cartilage formation at a defect locus in a mammal, the method comprising the step of administering osteogenic protein systemically to said mammal.

77. The method of claim 76 wherein said osteogenic protein is administered at a site distal to said locus.

78. A method for enhancing the quantity or quality of callus formation at an osteogenic defect locus in a mammal, the method comprising the step of administering osteogenic protein systemically to said mammal at a site distal to said locus.

79. A method for enhancing the rate of bone or cartilage repair at a local defect site in a mammal, the method comprising the step of administering an osteogenic protein systemically to said mammal at a site distal to said locus.

80. The method of claim 76, 78 or 79 wherein said defect locus defines a bone fracture.

81. The method of claim 76, 78, or 79 wherein said defect locus defines a volume incapable of endogenous repair.

82. The method of claim 76, 78, or 79 wherein said defect locus defines an osteochondral defect.

83. The method of claim 76, 78, or 79wherein said mammal is a human.

84. The method of claim 83 wherein said human has a reduced capacity to induce callus formation.

85. The method of claim 83wherein said human is afflicted with impaired blood flow to the skeletal extremities.

86. The method of claim 83 wherein said individual has a reduced capacity to induce an endogenous osteoinductive signal.

87. The method of claim 76, 78, or 79 wherein osteogenic protein is administered parenterally.

88. The method of claim 87 wherein osteogenic protein is administered intravenously.

89. The method of claim 76, 78, or 79 wherein said osteogenic protein is administered orally.

90. The method of claim 76 wherein said osteogenic protein is administered to said individual at a time when mesenchymal progenitor cells are accessible to said defect locus.

91. The method of claim 76, 78, or 79 wherein said osteogenic protein is administered at least six hours after the creation of said defect.

92. The method of claim 76 or 79 wherein said osteogenic protein is administered at least 24 hours after the creation of said defect.

93. The method of claim 76 or 79 wherein said osteogenic protein is administered at least 72 hours after the creation of said defect.

94. The method of claim 76, 78, or 79 wherein said osteogenic protein is administered to said mammal after the initiation of fibrosis at said defect locus.

95. The method of claim 76, 78, or 79 wherein said osteogenic protein is administered in aqueous solution.

96. The method of claim 83 wherein said human is a steroidal drug user.

97. The method of claim 83 wherein said human is aged, obese, or afflicted with osteopenia or diabetes.

98. The method of claim 76, 78, or 79 wherein said osteogenic protein is selected from the group consisting of: OP1; OP2, OP3, BMP2; BMP3; BMP4; BMP5; BMP6; BMP9; BMP-10, BMP-11, BMP-12, BMP-15, BMP-3b, DPP; Vg1; Vgr; 60A protein; GDF-1; GDF-3, GDF-5, GDF-6, GDF-7, GDF-8, GDF-9, GDF-10, GDF-11; and morphogenically active amino acid sequence variants thereof.

99. The method of claim 76, 78, or 79 wherein said osteogenic protein is selected from the group consisting of: OP1; OP2, BMP2; BMP4; BMP5; BMP6; and morphogenically active amino acid sequence variants thereof.

100. The method of claim 76, 78, or 79 wherein said osteogenic protein is a morphogen, said morphogen comprising an amino acid sequence having at least 70% homology within the C-terminal 102-106 amino acids, including the conserved seven cysteine domain, of human OP1.

101. The method of claim 76, 78, or 79 wherein said osteogenic protein is OP1.

102. The method of claim 76, 78, or 79 wherein said osteogenic protein is mature OP1 solubilized in a saline solution.

103. The method of claim 76, 78, or 79 wherein said osteogenic protein comprises an amino acid sequence defined by OPX (Seq. ID No. 3); Generic Sequence 6 (Seq. ID No. 4, Generic Sequence 7 (Seq. ID No. 5); Generic Sequence 8 (Seq. ID No. 6); or Generic Sequence 9 (Seq. ID No. 7).

104. A composition for systemic administration of an osteogenic protein to a mammal, said composition comprising osteogenic protein in an amount sufficient to induce bone or cartilage formation at a skeletal defect locus.

105. The composition of claim 104 wherein said composition comprises osteogenic protein dispersed in an aqueous solution.

106. The composition of claim 104 having a pH in the range of about 4-8.

107. The composition of claim 104 comprising physiologically buffered saline.

108. The composition of claim 104wherein said osteogenic protein is provided at a concentration within the range of about 0.01 - 1000 mg/kg body weight.

109. The composition of claim 104 comprising a formulation for parentral administration.

110. The composition of claim 104 formulated for oral administration.

111. The composition of claim 104 wherein said osteogenic protein is disposed in a biodegradable, biocompatible microsphere.

112. The composition of claim 104 comprising osteogenic protein in a concentration range of about 0.01 g/ml - 10.0 g/ml.

113. The composition of claim 104 comprising osteogenic protein in a con concentration range of about 0.1 g/ml - 1.0 g/ml.

114. The composition of claim 104 wherein said osteogenic protein is associated with a molecule competent to enhance solubility of said protein in aqueous media.

115. The composition of claim 104 wherein said osteogenic protein comprises of the soluble complex form of said protein.

116. The composition of claim 104 further characterized as competent to enhance the rate of bone formation at a local fracture site.

117. The composition of claim 104 wherein said osteogenic protein is selected from the group consisting of: OP1; OP2, OP3, BMP2; BMP3; BMP4; BMP5; BMP6; BMP9; BMP-10, BMP-11, BMP-12, BMP-15, BMP-3b, DPP; Vg1; Vgr; 60A protein; GDF-1; GDF-3, GDF-5, GDF-6, GDF-7, GDF-8, GDF-9, GDF-10, GDF-11; and morphogenically active amino acid sequence variants thereof.

118. The composition of claim 104 wherein said osteogenic protein is selected from the group consisting of: OP1; OP2, BMP2; BMP4; BMP5; BMP6; and morphogenically active amino acid sequence variants thereof.

119. The composition of claim 104 wherein said osteogenic protein is a morphogen, said morphogen comprising an amino acid sequence having at least 70% homology within the C-terminal 102-106 amino acids, including the conserved seven cysteine domain, of human OP1.

120. The composition of claim 104 wherein said osteogenic protein is OP1.

121. The composition of claim 104 wherein said osteogenic protein is mature OP1 solubilized in a saline solution.

122. The composition of claim 104 wherein said osteogenic protein comprises an amino acid sequence defined by OPX (Seq. ID No. 3); Generic Seq. 6 (Seq. ID No. 4); Generic Seq. 7 (Seq. ID No. 5); Generic Seq. 8 (Seq. ID No. 6); or Generic Seq. 9 (Seq. ID No. 7).